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Telstra ULLS Undertaking – ULLS International Benchmarking

An Advisory Note to the ACCC

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1 Executive Summary

This Advisory Note responds to ULLS International Benchmarking commentary submitted by Telstra in response to the ACCC's Draft Decision on Telstra's Access Undertaking for Unconditioned Local Loop Service, November 2008.

The ACCC requested Ovum to comment on factors raised in the Telstra supplied report from the Ingenious Consulting Network, specific to:

- general regulatory framework matters;
- population density (for Band 2 equivalent areas);
- land use (housing mix);
- copper prices;
- loop length; and
- pricing structure.

Notwithstanding that data is not easily available for comparative purposes, the following broad observations are possible:

- the proposed (weighted average) ULLS charge in Australia of $28.93 per month (this equates to the Telstra $30 proposal for Band 2 – see explanation in section 2.2 below) is not in line with LRIC-based determinations in other countries;
- taking population density into account, the monthly charge of $30 is not consistent with the countries referenced in the ACCC's Draft Decision;
- taking local loop lengths into account, the proposed ULLS monthly charge of $30 in Australia is not in line with those of like countries;
- using a pricing proxy such as the margin of typical retail internet access charges against ULLS monthly charges, i.e. as an estimate of the 'cost of access', the current Australian monthly charge appears to be broadly consistent with most LRIC-based ULLS charges in other countries.

2 ULLS International Benchmarking

2.1 Introduction

The Australian Competition & Consumer Commission (ACCC) has released a draft decision [1] on Telstra's Access Undertaking for Unconditioned Local Loop Service (ULLS), in which it has noted international benchmarks ([1], p. 42, Figure 6.1) for ULLS charges. It has concluded that the evidence indicates that Telstra's proposed monthly charge for Band 2 of $30 is excessive in terms of the benchmark.

As part of its response to the ACCC, Telstra has provided a report from the Ingenious Consulting Network [2] (hereafter the "ICN report") that indicates some adjustments that should be made to the benchmark in order to provide a fairer comparison with Australia.

In this Advisory Note, we consider six of the adjustment factors suggested in the ICN report, namely general regulatory framework, population density, land use, copper prices, loop length, and pricing structure. We exhibit, using data available to us, the resulting comparison with the proposed monthly ULLS charge in Australia. In all cases, we have undertaken only a broad comparison. The data points are illustrated in plot diagrams including a line of best fit.

In the following sections, we take each of the above factors given in the ICN report and, where possible, indicate the comparison with the proposed monthly charge in Australia. In all cases except Canada,[1] the ULLS rates shown are based on Ovum research benchmark data[2] in standard currency converted into AUD using a composite of exchange rate and Purchasing Power Parity (PPP).

2.2 Composite Exchange Rates

PPP rates are used to account for the purchasing power of different currencies in domestic markets for a given basket of goods. It is a widely accepted methodology to reflect differences in the cost of living and inflation rate of different countries.

For comparing wholesale charges in different countries, Ovum uses a composite exchange rate to take into account the different costs of labour and capital in those countries. That is, the average ULLS charge for each country has been converted into USD using a composite of 40 per cent exchange rate and 60 per cent purchasing power parity. The resulting composite rate reflects the fact that approximately 40 per cent of costs incurred are through capital equipment and 60 per cent of costs are due to labour. The assumption underlying this approximation

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[1] Note that, similar to Australia, the price for Canada differs according to geographic areas. We have taken an average for both Loop types A and B of USD 14.15 as stated in the OECD document, *Developments in Local Loop Unbundling* [4].

[2] *Europe & Americas additional benchmarks tables and charts* are a regular outcome of Ovum's Research Program and are available in Ovum's Telecoms Knowledge Center.

is that equipment can be imported and exported and an exchange rate would therefore be appropriate for comparing the cost of capital equipment. Labour costs, on the other hand, include cost-of-living factors for each country and therefore Purchasing Power Parity would be appropriate to use.

Ovum updates the exchange, Purchasing Power Parity and composite exchange rates for each country every quarter. For each country calculation in this report, however, an average exchange rate over the second quarter in 2008 has been used. The ULLS charges in original currency and the PPP factors are also taken from the second quarter of 2008. The rates in USD are converted to AUD using the AUD-USD composite rate.

Power Purchasing Parity rates are taken from *Economist Intelligence Unit*[3] and *Euromonitor*[4].

2.3 ULLS charges in Australia

For the comparisons below, we use weighted average monthly ULLS charges on a national level. In Australia, where a regulated monthly charge is determined for different Bands depending on the density of services in operation (SIOs), we have weighted the regulated Band 1, 2 and 3 charges by the latest available numbers of ULLS lines in each of those Bands. The following table shows the number of SIOs in each Band within Australia as at 31 December 2008 and the regulated monthly ULLS charge for each Band. A definition for each Band can be found in Telstra's document, *Service Quality Strategy* ([3], p. 3).

Figure 2.1: ULLS services in operations and regulated charges in Bands 1, 2, 3 and 4

	ULLS SIOs	Percentage	Monthly ULLS charge	
Band 1	28,453	4.66%	$	6.60
Band 2	574,465	94.08%	$	16.00
Band 3	7,555	1.24%	$	31.30
Band 4	127	0.02%	$	-
Total	610,600	100.00%		

Source: ACCC

Using the current regulated charges in this table, weighted by the percentages of SIOs in each Band, provides a weighted average charge of $15.75 per month. This is the Australian average charge used in the comparisons below. When the Telstra proposed monthly charge of $30 for Band 2 is substituted, then the weighted average monthly charge rises to $28.93 for Australia as a whole. This is the figure used for the "Telstra (proposed)" data point in the comparisons below.

[3] Source: www.eiu.com

[4] Source: www.euromonitor.com

2.4 Regulatory Framework

The regulatory framework in each country varies according to country-specific legislation and the regulations promulgated. This has an effect on the way ULLS charges are calculated and the process of reaching a regulated outcome. One key difference is whether or not the regulated charges are LRIC-based. LRIC is the cost basis broadly used in Australia.

Telstra's proposed ULLS charge of $30 per month for Band 2 gives rise to a weighted average monthly ULLS charge of $28.93 for Australia as a whole. This figure exceeds the ULLS charges in other countries with LRIC-based determinations as listed below. This also exceeds the current ULLS charge (weighted average) in Australia of $15.75.

In the following figure, we indicate the regulated ULLS monthly charges for those countries where LRIC is the basis for regulatory cost calculation. Countries taking a LRIC approach for setting regulated ULLS charges are: Austria, Denmark, France and Germany. See the Annex at the end of this report for more details on each of these countries.

Figure 2.2: ULLS Comparison for Countries with LRIC-based Costing

Country	Monthly ULLS cost (PPP)	Cost standard
Telstra (Proposed)	28.93	LRIC
Australia (Current)	15.75	LRIC
Germany	16.89	LRIC
Austria	15.20	LRIC
France	14.75	LRIC
Denmark	13.22	LRIC

Source: Ovum

It is useful to compare current and proposed Australian ULLS conditions to these countries because regulatory decisions on ULLS have been in place for similar periods of time, typically more than five years. These are also developed countries where market structure is broadly similar to that of Australia with competitive pressure from DSL and cable providers.

In the following figure, we show the regulated ULLS monthly charges where a different costing basis applies. A Fully Allocated Cost (FAC) or Fully Distributed Cost (FDC) approach to determine the regulated ULLS charges is taken by the following countries: Sweden, Italy, Finland, Spain, United Kingdom. A similar approach, called EDC, is taken in the Netherlands.

Figure 2.3: ULLS Comparison for Countries with FAC, FDC or EDC-based Costing

Country	Monthly ULLS cost (PPP)	Cost standard
Sweden	12.90	FDC
Italy	12.45	FDC
Finland	16.95	FAC
Spain	16.94	FAC
United Kingdom	15.23	FAC
Netherlands	12.87	EDC

Source: Ovum

In countries where a FAC, FDC, or Embedded Direct Cost (EDC) [5] approach is taken by the relevant national regulatory authority, we expect the regulated rates generally to be above a theoretical LRIC-based determination. Historic cost under a FAC, FDC and EDC approach covers all cost components such as overheads and staff for billing and administration. Under a LRIC approach, only a proportion of these overheads is taken into account. In both cases, common costs are then allocated to the products, i.e. services, on the basis of some specified formula. Unlike LRIC, however, the allocation methods under a FAC, FDC and EDC approach are based on accounting rather than economic principles.

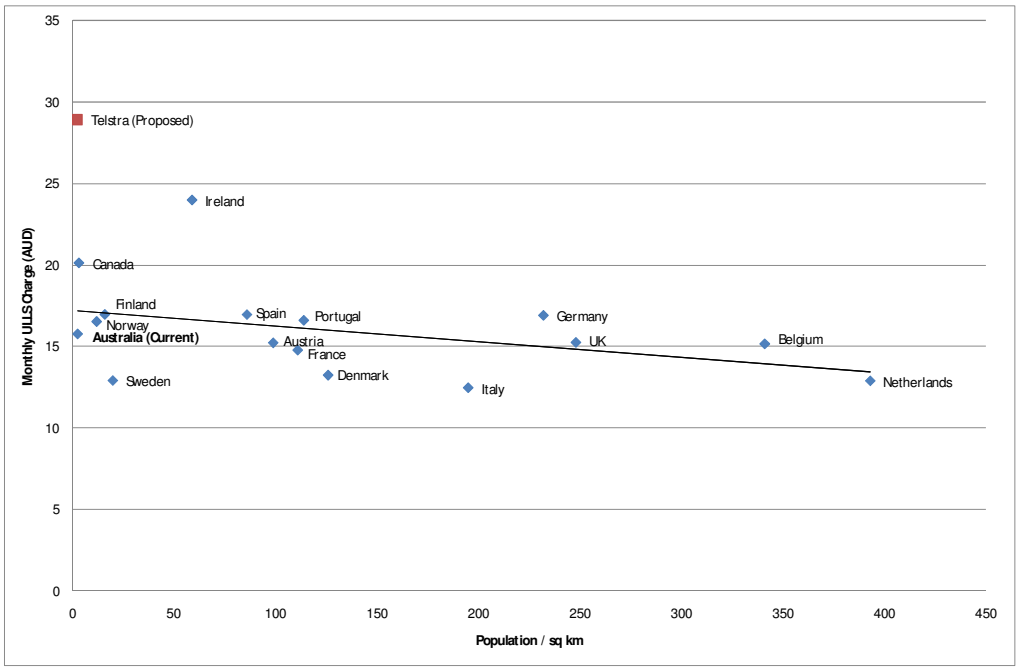
2.5 Population Density

One issue that often arises in comparisons with Australia is that of population density. Australia's overall population density is very low, approximately 3 persons per sqr km.[6] The following figure enables comparison of the proposed monthly charge for Band 2 of $30 and the current Australian average ULLS charge compared to the ULLS charges of European and North American countries.

[5] For further information on the EDC methodology mandated by the national regulatory authority in the Netherlands, see the OECD document under the following link: http://www.oecd.org/dataoecd/5/34/2752795.pdf [accessed 9 February 2009].

[6] United Nations, *The United Nations World Population Prospects: The 2006 Revision.*

Figure 2.4: Monthly ULLS Charge vs Population Density (June 2008)



Source: Ovum

It should be noted that the Telstra proposed monthly charge substantially exceeds all the other charges shown in the figure.

The figure shows that the current Australian monthly charge of $15.75 is broadly consistent, on the basis of population density, with the countries referenced in the ACCC's Draft Decision [1]. For Australia's Band 2 (suburbs and regional centres), the population density is much higher than the Australian average. This would suggest that the current Band 2 ULLS charge of $16/month is somewhat high compared to the charge in other countries.

2.6 Land Use

Land use (housing mix) is one of the factors given in the ICN report [2]. As we did not have reliable land use data available, we have not attempted a comparison based on that factor.

We note in passing that land use and population density are correlated and hence some of the variability due to land use will be captured by population density.

2.7 Copper Prices

The change in copper prices is one of the factors given in the ICN report [2]. The argument is that copper prices have been generally increasing and have been widely varying since January 2006. The general level of copper prices affects the cost of copper cable.

While we note that copper prices have been generally increasing, we have not attempted to estimate a long-term price for copper cable. Copper cable is an

international commodity and we would expect that the landed prices of copper cable are similar in all countries comparable to Australia. The copper price is therefore a common factor between countries.

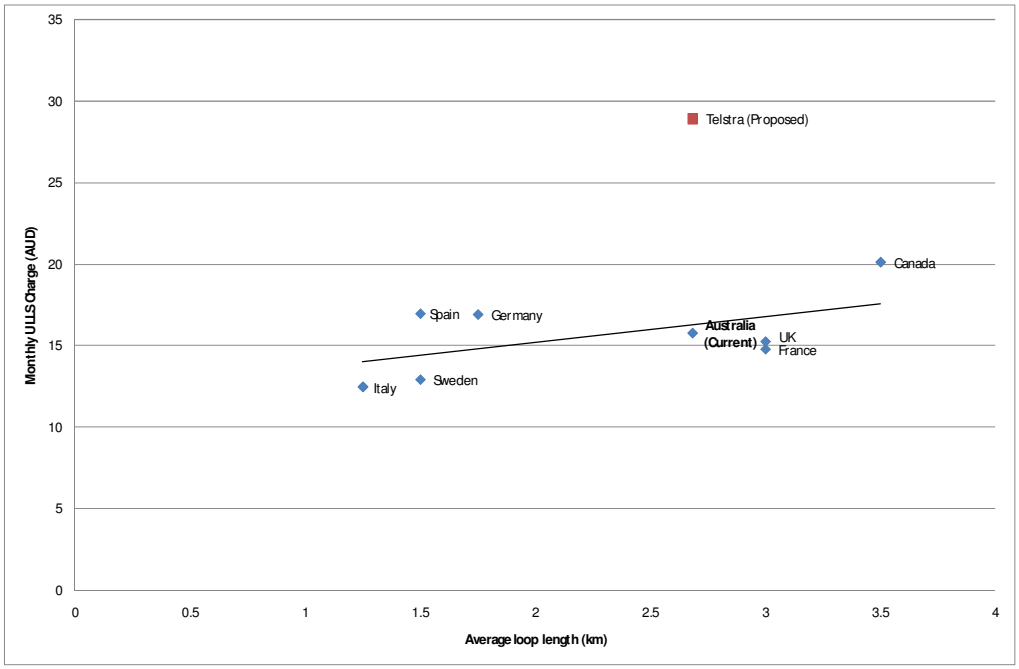
A general increase in copper cable prices would feed into a trend to raise ULLS charges over time (if the regulated charge is cost-based). The time at which regulated decisions are made could, therefore, be factored into an international comparison. As we do not have reliable data on copper cable prices over time, we have not attempted to undertake this comparison. We understand such data is unlikely to be available due to commercial confidentiality.

2.8 Loop Lengths

The distribution of loop lengths in a country affects the quantities of cable and structure needed for an access network and hence feeds into the cost base for the ULLS monthly charge. Average loop lengths can therefore provide an adjustment to ULLS monthly charges in international comparisons.

The following figure shows the regulated monthly ULLS charges in selected countries against the average loop length. Average loop lengths are available only for a few countries. In this figure, we have used the ITIF report [5] to obtain average loop lengths outside Australia. For Australia, we have used a lower-bound estimate for Band 2 from the data in the TEA model, version 1.3. Thus, the average loop length for Australia is likely to be an underestimate for the national average Australian loop length.

Figure 2.5: Monthly ULLS Charge vs Average Loop Length (June 2008)



Source: Ovum

It should be noted that the Telstra proposed ULLS monthly charge is well above any of the other charges shown in the figure. Even if the average loop length were

seriously underestimated, the Telstra proposed figure would fall well above the trend line.

It can be seen in the above figure that the current ULLS monthly charge in Australia is broadly in line with those of other countries. In Canada, with a roughly similar population density but longer average loop length, the ULLS monthly charge is above AUD 20.

2.9 Pricing Structure

The general pricing structure in a country may affect the level of ULLS charges. Although some factors are taken into account by the PPP conversion, nevertheless the structure of the telecommunications industry and the general level of competition may affect the ULLS result.

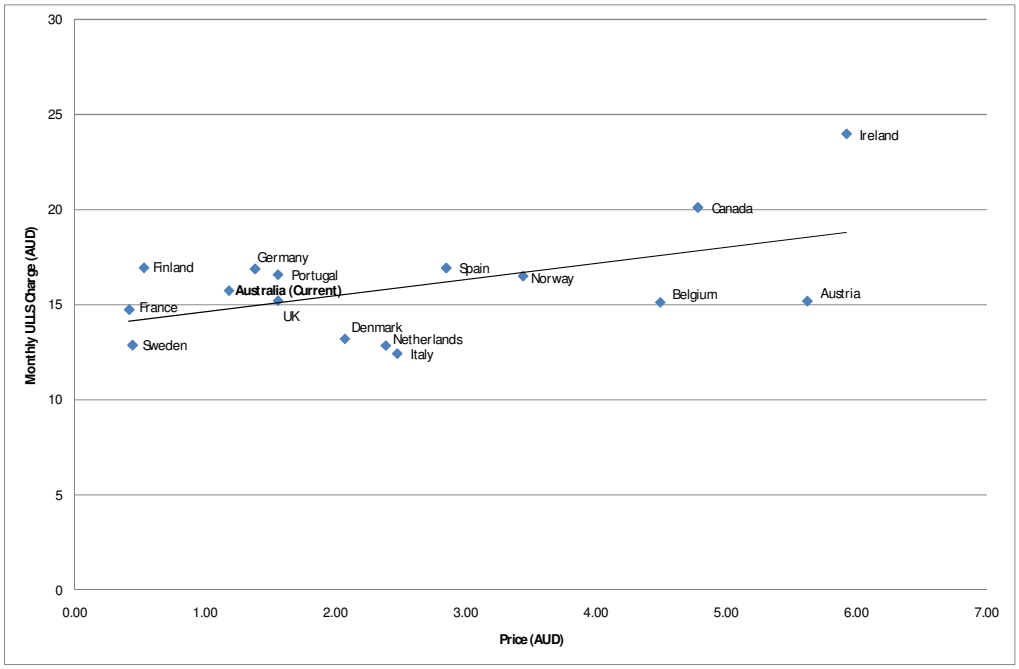
The ICN Report [2] observes that upfront connection charges are also relevant to benchmarking ULLS charges and suggests that a 'whole of life' approach should be taken to benchmarking the mix of ULLS charges. As sufficient data was not available, we have not examined this proposition more closely. We have reservations, however, about considering such fixed costs, as they can have different purposes and therefore be subject to variability. It should also be noted that the TEA model, used by Telstra for estimating ULLS charges, is concerned with running costs, not one-off charges.

In this section, we provide two comparisons with general pricing structure.

ULLS is used by a competitor of the incumbent operator to provide internet access (ADSL) and telephony. One general pricing comparison is to compare the ULLS monthly charge with the lowest monthly retail price charged by the incumbent and competitors. This is a measure used by ITIF [5] to assess the affordability (on a per-bit basis) of higher quality broadband services. In the following figure, we show this comparison. Here the lowest monthly price is in units of AUD per Mb/s. The data is taken from "ITIF's Broadband Rankings Among the 30 OECD Countries, 2007" [5].[7]

[7] In this comparison, we use the price data from the ITIF report, which uses OECD data from June 2007. OECD data for October 2007 is available for other purposes.

Figure 2.6: Monthly ULLS Charge vs Lowest Monthly Price per Mb/s (June 2007)



Source: Ovum, based on ITIF analysis [3]

The proposed monthly charge for Band 2 of $30 would push the Australian data point upwards and to the right (as companies adjust their retail charges) of its current position in the figure. The proposed monthly charge is greater than any of the ULLS charges shown.

It can be seen from this figure that the Australian average ULLS charge is somewhat higher than those of other countries in terms of comparison with lowest retail price, but there is a good deal of variability in the data.

A second comparison is with the general retail price level for internet access in each country. The retail price chosen for this comparison should be a weighted average of the retail prices charged to consumers, weighted by number of subscribers and availability of the retail service.

We may define the ULLS Margin Factor by:

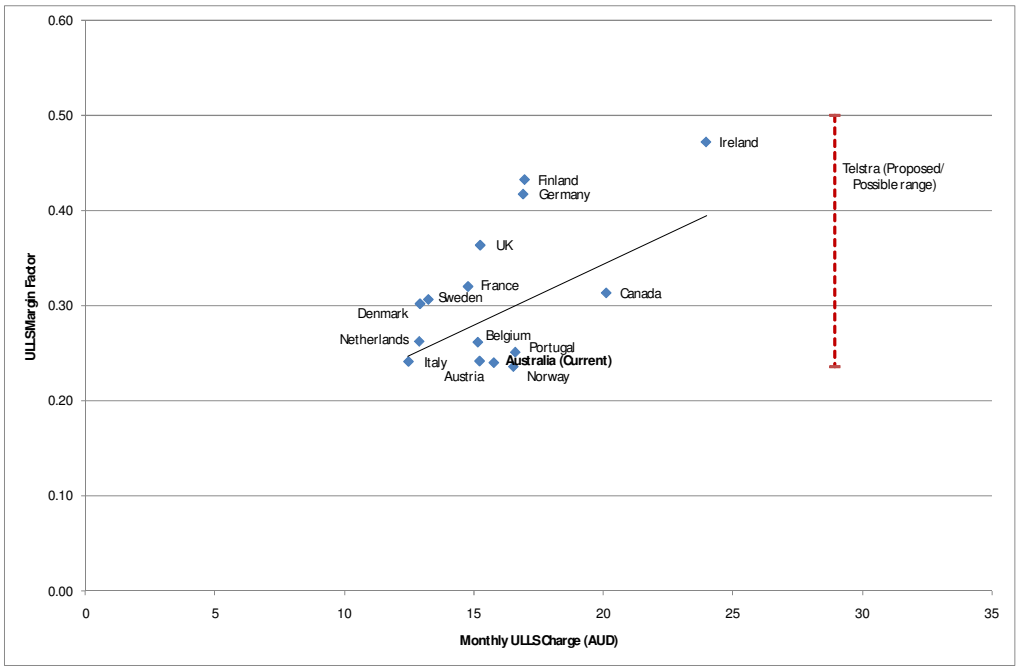
ULLS Margin Factor = ULLS Monthly Charge/Average Retail Price.

Generally, one could expect that the ULLS Margin Factor is less than 1. It indicates how much of the retail price is consumed by the ULLS charge. If the ULLS Margin Factor is high, it means that there is little room for competition. If the ULLS Margin Factor is low, then there is scope for competitors to provide their own retail services. Other factors are also relevant: for example, the extent of competition at retail and wholesale levels. The interpretation of the ULLS margin will depend to some extent on the specific circumstances in the relevant national markets.

The following figure shows the comparison of ULLS Margin Factor with monthly ULLS charges for a large sample of countries. The average retail prices used to

calculate the ULLS margin factors are taken from OECD statistics for October 2007.[8]

Figure 2.7: ULLS Margin Factor vs Monthly ULLS Charge (October 2007)



Source: Ovum

The proposed monthly ULLS charge for Band 2 of $30 would put upward pressure on the retail prices offered by alternative operators in the Australian market. A $30 monthly charge would mean a ULLS Margin Factor of 0.38 if retail prices were to remain unchanged. The figure above indicates a range of possible ULLS Margin Factors around that number as it is difficult to anticipate retail effects. This is a shift away from the current position that appears broadly consistent with regulated charges in other countries.

While there is a good deal of variability in the above figure, we note that there are several high outliers. For Ireland, Finland and the UK, the incumbents have increased their fixed broadband market share for the period ending October 2007.[9] Ireland also has a limited number of operators and was delayed in implementing local loop unbundling arrangements compared to other European countries. In the case of Germany, there is a relatively high level of competition, both in wholesale and retail. This has put downward pressure on retail charges, leading to a higher ULLS margin.

[8] OECD statistics for October 2007 are available at: http://www.oecd.org/sti/ict/broadband [accessed 2 February 2009].

[9] European Electronic Communications Regulations and Markets 2007 (13th Report) Annex 2

2.10 Conclusion

The ICN report raises a number of factors that are relevant to benchmarking ULLS charges internationally. Comparing like-for-like data for all these factors would require a more thorough review and analysis of the matters raised than has been possible in this report. While the ICN report raises questions about benchmark comparisons, this Ovum Advisory Note illustrates some further comparisons based on actual available data.

This report provides comparisons enabling the following observations:

- with reference to population density and average loop lengths, the proposed monthly ULLS Band 2 charge of $30 in Australia would appear to be higher than other countries' regulated charges;
- the pricing proxy approach – in which we compare the monthly ULLS charge with an indicative retail price of access through the margin represented by the ULLS charge – shows that a $30 per month charge produces a higher 'margin factor' which is less consistent with most other LRIC-based country comparators. The current monthly charge in Australia appears more consistent with most other LRIC-based country charges.

3 References

The following submissions and other documents have been used in compiling this Advisory Note.

[1] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking" – Draft Decision, November 2008.

[2] Ingenious Consulting Network, "Commentary on: The use of international benchmarking in setting interconnection rates", *A report from the Ingenious Consulting Network*, December 2008.

[3] Telstra Corporation Limited, "Service Quality Strategy", Telstra document in support of its operational separation plan, 23 June 2006.

[4] Organisation for Economic Co-Operation and Development (OECD), "Developments in Local Loop Unbundling", A report presented to the Working Party on Telecommunications and Information Services Policy (TISP), 10 September 2003.

[5] The Information Technology and Innovation Foundation (ITIF), "Explaining International Broadband Leadership", May 2008.

Annex: Selected Country Summaries

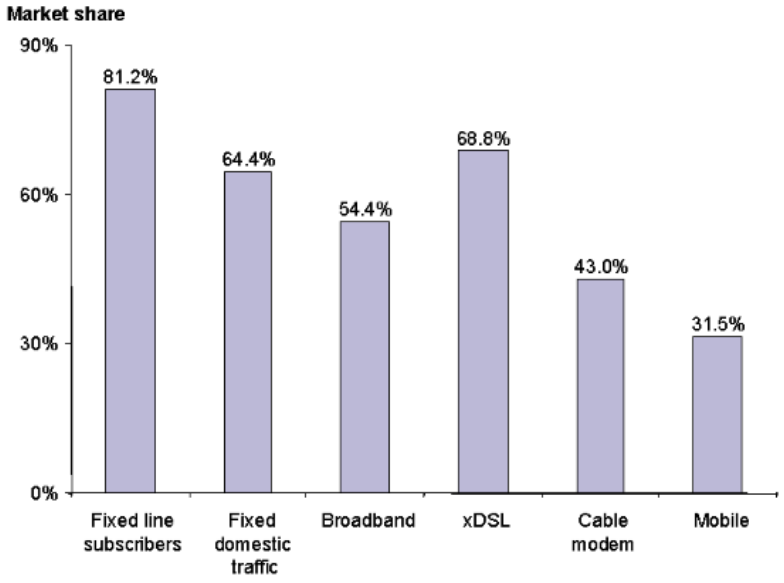
Denmark

At the end of 2007, TDC (formerly Tele Danmark) accounted for 81.2% of fixed lines in Denmark, and 64.4% of all domestic traffic (as shown in Figure A.1). Tele2 is TDC's key competitor with a 9.8% market share of domestic traffic. Telia is the second-largest competitor with a 5.7% share, closely followed by Telenor-owned Sonofon, with 4.6% of traffic.

Tele2, ACN, Prime Networks and Telia have taken advantage of carrier pre-selection (CPS) and wholesale line rental (WLR) to enter the fixed voice markets.

Figure A.1 shows the market shares of incumbent TDC in the fixed and mobile markets

Figure A.1: TDC: market share in Denmark



Source: NITA

Denmark has the highest broadband household penetration in the Nordic region, with a 36% population penetration rate. As of the second half of 2007, broadband subscribers totalled 1,977,000.

FTTx and FTTH are growing in the Danish broadband market. As of the end of 2007, there were 71,108 FTTH subscribers. Nevertheless, xDSL is still the main broadband technology, with 1.2 million subscribers (61% of the broadband market).

Price competition was particularly noticeable in the broadband area in 2007. At the same time, there was a marked increase in the share of broadband subscriptions

using high speeds, with the price for a 2 Mbit/s broadband connection falling by more than 35% between November 2006 and May 2007.[10]

Local loop unbundling (LLU)

Full LLU has been available in Denmark since 1 July 1998. By September 1999, only one company, Cybercity, had concluded an LLU agreement with TDC. As of the second half of 2007, over 178,339 lines had been fully unbundled. Additionally there were 63,984 subscribers via shared access in Denmark.

The European Commission also notes:

> *The number of wholesale LLU lines in the form of fully unbundled lines has continued to increase, reaching 188 492 lines in January 2008 compared to 102 023 lines in January 2007. The shared access lines supplied by the incumbent to new entrants, however, fell from 87 025 to 49 874 in the same period.*
>
> *The connection prices for fully unbundled local loops as well as for shared access continued to decrease in the year prior to October 2007, by approx. 15% and 17% respectively, keeping them among the lowest in the EU. The monthly rental prices stayed at a constant level, with €8.61 for fully unbundled loops (EU average: €10) and €4.3 for shared access (EU average: €3).*[11]

Since January 2003, TDC's prices for fully unbundled and shared access loop rental have been approved by the regulator using an LRAIC model. The current fully unbundled and shared access prices were set by NITA at end of 2007 based on the LRAIC model.

Wholesale broadband services

Bitstream was first introduced in Denmark in 2000 under the rule of non-discrimination, and was implemented by law in 2001. TDC was found to have significant market power according to the last market analysis published in November 2005, and was the dominant player with a market share of 86%. The following were the main points that came out of the market analysis:

- introduction of an IP bitstream: TDC must allow alternative operators to access the net from the IP point of access, as well as the currently available ATM node;
- naked DSL (or NDSL) at lower prices: NDSL was available in Denmark prior to the current decision, but alternative operators were asked to pay for a so-called 'carrier line'. The price of a carrier line corresponded to the price of providing a phone line to the end user. The new decision obliges TDC to remove the cost of the carrier line for alternative operators, reducing the price of NDSL as a result

[10] European Electronic Communications Regulations and Markets 2007 (13th Report) Annex 2

[11] Ibid.

- geographic de-averaging: TDC is no longer able to charge competitors more in less profitable areas – so-called geographic de-averaging. A unified national price means that it will be easier for alternative operators to establish themselves in less densely populated areas where TDC previously held an advantage. It will also increase end-user choice in the broadband market.

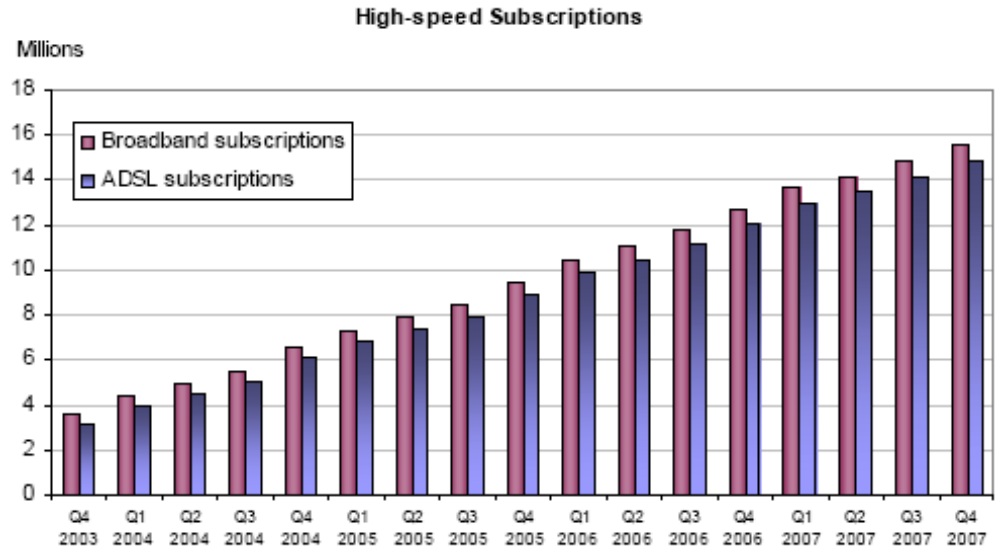
By the end of 2007, bitstream access had reached 77.3% of total DSL lines. This means that competitor access using NDSL, at end 2007, is confined to 22.7% of overall DSL lines.

France

Network technology and service types

France is one of Europe's fastest growing markets for high-speed Internet access. According to ARCEP, the French regulator, France had 15.5 million broadband subscribers in December 2007, reflecting year-on-year growth of 22%. Of these, 14.80 million were DSL subscribers. Broadband penetration is 24% on a population basis. Figure A.2 shows broadband and ADSL subscription trends for the 4Q03–4Q07 period.

Figure A.2: France: total broadband and ADSL subscriptions, 4Q03–4Q07



Source: ARCEP

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The growth in the French market is driven by the high level of competition spurred by its bitstream access and local loop unbundling (LLU) markets, which have been actively promoted by the regulator, ARCEP. In December 2007, France Telecom (FT) was leasing 7.5 million wholesale lines, which included 5.2 million LLU services. LLU is the main driver of FT's wholesale growth.

All major broadband operators are now focusing their marketing on triple-play packages.

- France Telecom – DSL plus TV and telephone: 8Mbps, €39.90 per month; 18Mbbps, €44.90
- Iliad – DSL plus TV and telephone: 20Mbps, €29.99
- Neuf Cegetel – DSL plus TV and telephone: 20Mbps, €29.90[12]

In January 2006, FT announced it was dropping plans to deploy fibre-to-the-node (FTTN)/VDSL in favour of a direct transition to fibre-to-the-home (FTTH). All of the major DSL operators are now proposing a direct jump to FTTH, without an intervening FTTN step.

Competition

Most broadband still based on FT's copper network

The household broadband penetration rate at the end of 2007 was approximately 51%. Of this base, almost all is ADSL, with the remainder accessing services through cable modem and FTTH. In December 2007, France Telecom (Orange) held 49.4% connection share, while Iliad and Neuf held 19.7% and 17.5%, respectively.

Competition in France is still largely based on unconditioned local loop (ULL), but France Telecom's competitors do not have a fully national DSLAM network. In December 2007, 68% of the population had access to LLU-based competitive DSL offerings. Outside these areas, France Telecom's competitors offer a national service through France Telecom's wholesale bitstream services.

In December 2007, competitive ULL accounted for 5.2 million subscribers out of a total 15.5 million DSL subscribers, while competitive bitstream accounted for 2.2 million. These represent approximately 34% and 14% of the DSL subscriber base, respectively.

In 2008, the number of unbundled lines increased to almost 5.9 million in 2Q08. This represented 17% of all fixed lines – an increase of 26.3% over the preceding year. Of these unbundled lines, 1.5 million were partially unbundled and more than 4.3 million were fully unbundled.

In 2008, ARCEP undertook a new market analysis covering wholesale access to the local loop, in which it continued to impose a number of remedies on France Telecom. These included the obligation to grant unbundled access to metallic loops and sub-loops for alternative operators; to grant access to its civil works infrastructure, ducts, chambers and any underground infrastructure; and to implement cost-oriented prices.[13]

Competition in France is mostly based on FT's old copper network, which is subject to close regulation. ULL, line sharing services and wholesale bitstream services are all mandated and regulated in France. Figure A.3 shows how this breakdown has evolved since 2002.[14]

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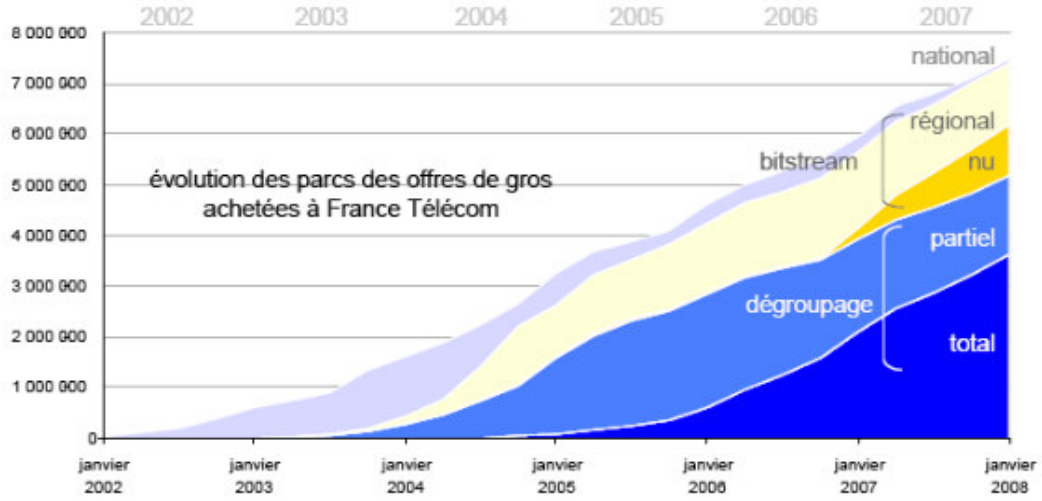
[12] Next-generation access country overview: France, 7 July 2008

[13] Ovum - France (country regulation overview), 28 November 2008

[14] Ovum - Next-generation access country overview: France, 7 July 2008

Figure A.3: France Telecom wholesale DSL connections, 2002-07



Source: ARCEP

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The different wholesale offers shown in Figure A.3 are classified as follows:

National bitstream: This service allows a competitor to offer national broadband services over the FT network using a single point of interconnection in Paris. The service was deregulated in 2006 and is being rapidly phased out.

Regional bitstream: This service requires a competitor to build backhaul and establish several regional points of interconnection. The customer keeps a subscription to the traditional telephone service.

Naked ("nu") ADSL bitstream: This is a regional bitstream service that does not include a traditional telephone service.

Partial unbundling ("degroupage partiel"): The copper line is shared, with the incumbent providing a PSTN voice service and the competitor providing a broadband service off its own exchange infrastructure.

Full unbundling ("degroupage total"): Used by the competitor to provide both PSTN voice and broadband services off its own exchange infrastructure.

Whilst DSL competition is vigorous, competition from other technologies is minimal. There is little cable broadband or other broadband penetration in France, although there have been announcements of Fibre to the Building for parts of Paris and other cities. The consolidation of the major cable operators NC Numericable, UPC France and France Telecom Cable into the Altice One group in the past three years may help improve cable competitiveness. Altice One is a pan-European cable operator, but in France it has kept the existing brands of its acquired operators.

Austria

Fixed market overview

From 1 January 1998, Austria deregulated its fixed telecommunications market ensuring free and effective competition in accordance with EU directives. Despite the incumbent's current market share of approximately 56%, there are currently 38 alternative operators in the market competing with Telekom Austria.

In its latest market analysis of the market for wholesale broadband access, the Austrian regulator (TKK) has followed a similar approach to Ofcom in the UK by applying remedies for different geographical areas. The regulator therefore recognises geographic variations in the competitive conditions existing within the country. Fibre-to-the-node (FTTN) products are included in the market definition for wholesale broadband access, whereas Fibre-to-the-home (FTTH) products are not included, due to its limited offering and the resulting limited impact so far on the market.

Local Loop unbundling

Telekom Austria has been identified as having significant market power (SMP) in July 1999 and has since been required to provide access to its local loop, on request by competitors. This was confirmed by market reviews in 2004 and December 2006, where the regulator decided that the ULLS charge should be based on forward-looking long-run average incremental costs (FL-LRAIC). In the 2006 decision, remedies other than granting access to unbundled loops and sub-loops include access to accompanying ancillary services, including collocation, and to publish a reference offer on those services.

Germany

Fixed market overview

Germany deregulated the fixed telecommunications market on 1 January 1998 in accordance with the EU directive. With competition rapidly evolving, Germany has become one of the most competitive DSL markets on both levels, retail using Deutsche Telekom's resale offers, and wholesale based on local loop unbundling.

The broadband market in Germany can be described as one of the most dynamic markets in Europe, with a broadband penetration rate above European average (18%). Broadband competition in Germany has been intensified. By end of 2007, 54% of all broadband connections were provided by competitors, of which 36% of these connections are resale lines. New entrants in the previous year, however, have been entering the market using more fully unbundled lines rather than using resale. Providers offering broadband mostly in regional areas have continued to roll out their own infrastructure.

DSL is the dominant broadband technology in Germany, accounting for 80.2% of the total broadband connections. There are several competitors that offer DSL services based on their own local infrastructure, with local carriers also having deployed DSLAM's in certain regions/cities. The numbers presented above,

however, also show a lack of alternative technologies other than DSL, such as cable. At a relatively late stage, BNetzA has defined two separate bitstream markets, IP bitstream and ATM bitstream access.

Local Loop unbundling

Since 2002, prices for unbundling local loop are required to be cost based and are based in Germany on a LRIC cost model. In its latest market analysis in 2007, BNetzA found that Deutsche Telekom continues to have significant market power regarding local loop. Existing obligations on access to the local loop are therefore to be maintained. Deutsche Telekom also will be required to provide competitors access to its ducts between the street cabinets and the main distribution frame. In cases where this does not appear to be practical, the order extends to grant competitors access to Deutsche Telekom's dark fibre.